

Prussian blue, he fancied he had settled the grand and difficult problems connected with the colouring matter of leaves. While the isolated position of Fusinieri, and the want of contact with better scientific minds than his own, will account for this, we must not forget that the abject political condition of the land and the narrow jealousy of its multiplied rulers made it difficult for a man to work intellectually or to teach properly, so that we may well express our admiration that one so hampered has achieved so much, and set so good an example to his more fortunate countrymen. May their scientific efforts prosper!

C. T.

SCIENCE IN GERMANY

(From a German Correspondent)

HERR W. SIEMENS has recently made the following interesting communication to the Academy of Sciences of Berlin:—

It has been shown by Willoughby Smith and by Sale that crystalline selenium conducts electricity better when illuminated than when in darkness. The specific conductivity, however, of selenium rendered crystalline by heating from 100° to 150° C. is very small and extremely variable; and also the increase of the conductivity through illumination is very inconstant, so that it is impossible to establish a determinate dependence of the conductivity on the illumination.

Herr Siemens has succeeded, by continuous heating of amorphous selenium to a temperature of 210°, as also by cooling of melted selenium to 210° (at which temperature, long continued, the selenium passes into a coarse-grained crystalline state), in producing another modification of the crystalline selenium, which has considerably greater conductivity, and retains it, and conducts electricity metallically, so that with increase of temperature the conductivity decreases. The action of light on this modification of crystalline selenium is much greater, and apparently quite constant. By fusing in two flat spirals of wire, about 1 millimetre apart, between two leaves of mica in coarsely crystalline selenium, he has obtained an exceedingly sensitive measure of light. Dark heat rays are *without direct influence* on the conductivity, and heating of the selenium, as already mentioned, *diminishes* the same. Diffuse daylight even doubles the conductivity of this light-measure, and direct sunlight increases it sometimes *more than tenfold*. The increase of conductivity of the coarse-grained selenium through illumination takes place very quickly. And similarly, the diminution of it, on shutting off the light, occurs, apparently, at once; but a longer time is required before the state corresponding to darkness is again fully established. The increase of the conductivity is not proportional to the light intensity, but a function of it, which comes near the proportion of the square root of the light intensities.

Herr Siemens hopes this interesting property of selenium may be utilised for construction of a reliable photometer.

W.

NOTES

EVERY one will hear with genuine regret of the proposed resignation by Prof. Max Müller of the Chair of Comparative Philology in Oxford University. He has resolved to take this step on the ground that he begins to feel the need of rest, and that he wishes to be able to devote all his attention to the ancient language and literature of India. He has just finished, he says, the work of his life, the *Editio Princeps* of the text and commentary of the oldest of the sacred books of the Brahmans, the oldest of the Aryan world. It was this which first brought him to England in 1846, and it was in order to be able to stay in England that he accepted the duties of professor. Dr. Müller

was appointed to the Chair of Natural Philology in 1868, in which year it was founded and endowed. "I have," he justly states, "satisfaction that I leave the new science of language, to which my work as Professor has been mainly devoted, firmly established in the system of academic studies, and that the University will find among my pupils several quite able to fill my place." It will not be an easy matter, we fear, to find a worthy successor.

THERE has just been placed in Westminster Abbey a marble scroll bearing an appropriate inscription to the memory of Jeremiah Horrocks. The movement for such a memorial was commenced some time ago, and is referred to in *NATURE*, vol. x. p. 190, and xi. p. 31. The scroll is affixed to the pedestal of the monument of John Conduitt, nephew of Sir Isaac Newton, which is situated at the extreme west end of the north side of the nave, and exactly opposite that of Newton, at the extreme east end. The inscription is as follows:—

In Memory of
JEREMIAH HORROCKS,
Curate of Hoole, in Lancashire,
Who died on the 3d of January, 1641, in or near his 22d year;
Having in so short a life
Detected the long inequality in the mean motion of Jupiter and Saturn;
Discovered the orbit of the Moon to be an ellipse;
Determined the motion of the lunar apse;
Suggested the physical cause of its revolution;
And predicted from his own observations the Transit of Venus,
Which was seen by himself and his friend William Crabtree
On Sunday the 24th of November (O.S.) 1639:
This Tablet, facing the Monument of Newton,
Was raised after the lapse of more than two centuries, December 9, 1874.

The friends of Horrocks are indebted for the inscription to the joint labour of the Dean of Westminster and Prof H. J. S. Smith. It is a simple act of justice to state that the idea of this tablet was suggested by two ladies, Mrs. Orme and Mrs. Patmore, and that upon the latter has fallen the burden and heat of the day so far as the correspondence with subscribers is concerned.

M. LE VERRIER, as President of the Scientific Association of France, has received the handsome sum of 2,300 francs from M. P. Bischoffsheim to meet the balance of the expense incurred during the important and refined experiments conducted by M. Cornu, towards determining with great precision the velocity of light, an expense which otherwise must have been borne by the eminent savant who directed the experiments.

CONSIDERABLE dissatisfaction is felt among the Fellows of the Linnean Society at the delay in the publication of the zoological papers communicated to it. The zoological paper last published in the Journal is dated Dec. 17, 1874, and that in the Transactions, Nov. 19, 1874. It is said that there are at least a dozen awaiting publication, and the number is likely to be increased. There is reason to fear that no zoological paper communicated during the present year will appear before the end of it.

A REPORT is widely circulating in Oxford University to the effect that Lord Salisbury, its Chancellor, is endeavouring to obtain the issue of a Commission for inquiring into the question of University Reform. Another form of the report is that the Commission will have an executive character. A third rumour names Mr. Gladstone as one of the Commissioners. But nothing certain is known upon the subject at Oxford.

THE January number of the *Practitioner* will contain a memoir of the late Dr. Francis E. Anstie, by Dr. Buzzard, with a portrait engraved on steel. This number will also contain some of Dr. Anstie's unpublished researches on alcohol.

DR. BURDON SANDERSON announces that the first of his annual course of Lectures on Comparative Pathology will be given at the University of London, on Wednesday next, Dec. 15. Subject—The Pathology of Inflammation.

WE are glad to see that the movement for organising a University College of Science and Literature in Bristol is so far advanced that a meeting of the subscribers will be held in Bristol on Saturday next, to authorise the committee to take the necessary steps to incorporate the College. In a telling article in Monday's *Western Daily Press* the need of such an educational institution in Bristol, as well as in all our other industrial centres, is forcibly shown. The increasing importance of scientific knowledge even in our most trivial manufactures is well pointed out; only by thoroughly training the rising generation can we hope to compete successfully with foreign manufacturers. It is a hopeful sign to find the subject taken up by the newspaper press in the spirit which animates the article referred to.

THE Vivisection Commissioners, having now received the evidence of a large number of witnesses, will not meet again for some weeks. They will then assemble to examine a few more witnesses, after which it is announced they will at once proceed to consider their report.

THE French Society of Aërial Navigation held its anniversary meeting on the 3rd December, under the presidency of M. Paul Bert. M. Bert delivered, before a full audience, an address reviewing all the scientific ascents executed during the year. The Society, after hearing a lecture by M. Tissandier, illustrated with dissolving views, awarded him a prize. A similar reward was given to the President of the London Aéronautical Society.

THE Cambridge Board of Natural Sciences Studies report that the period of three years for which the University agreed to pay 100*l.* a year towards the expenses of Dr. Dohrn's Zoological Station at Naples will expire next year, and they have had under consideration the expediency of recommending a continuance of the grant. For the sum of 100*l.* the University has hitherto had the exceptional privilege of occupying two of the large working tables. Dr. Dohrn is unable to continue the offer of accommodation on the same terms, but offers one or two tables of 75*l.* per table. The Board, considering the claims upon the Worts' Travelling Bachelors' Fund, do not think it right to charge that fund with two tables at the increased price; and, therefore, recommend that one table be retained by the University for five years at the rate of 75*l.* per annum. The Board have reason to believe that very valuable work has been done by nominees of the University at the station, and the Cambridge Museum enriched by important specimens procured from it. Mr. T. W. Bridge, scholar of Trinity, and Mr. J. F. Bullar, of Trinity, have been nominated by the Board of Natural Sciences Studies to study at the Zoological Station, Naples, until July 1876.

THERE will be an examination at Christ's College, Cambridge, for scholarships and Exhibitions in Natural Science on April 4, 1876. The examination will be open to any one, and there is no restriction as to age. This examination will be held at the same time as similar ones in connection with Sidney Sussex and Emmanuel Colleges, the candidates of either of these colleges being eligible at the other two in default of properly qualified candidates at these colleges.

DR. GUSTAVUS HINRICHS has written in the *Popular Science Monthly* an interesting account of one of the most remarkable meteors of recent times, which lighted up the entire State of Iowa and neighbouring parts of the States of Missouri, Illinois, Wisconsin, and Minnesota, at 10.20 P.M., on Friday, Feb. 12, 1875. This meteor is stated to have become visible at a height of about 150 miles above Pleasantville, Iowa, to have descended at an angle of about 45°, its course being at first a little to E. of N., but deviating gradually more and more to E. in a curved line. It divided into two in passing over the N.W. township of Keokuk country, and finally exploded at a height of ten miles over a point three miles S.W. of Norway, one of the stations on the Chicago and North-Western Railway. It was the

smaller portion of the meteor which produced the meteorite shower in Iowa and Amana townships of Iowa County. Two dollars a pound being given for all meteors collected, a large number have been gathered together varying in weight from 75 lbs. to 2 oz., and amounting in all to upwards of 500 lbs. A woodcut is given, showing nine of the fragments, drawn to one-seventh of their natural size, and a small map with the positions in which the meteors have been found. A map, defining the course of the meteor from all the observations made would have been a useful addition to the paper.

THE *Meteorological Bulletin* of the Pyrénées-Orientales for the year 1874, published under the auspices of the department and the town of Perpignan, contains the following:—(1) *Résumé* of the daily observations referring to agricultural meteorology and the state of vegetation collected at Collioure during 1873-74, by M. Ch. Naudin, Member of the Academy of Sciences; (2) Returns of the state of the crops in Roussillon during the same time, by M. Labau, Director of the school-farm of Germainville; (3) Notice of the thunderstorms observed in the department of the Pyrénées-Orientales, by M. Tastu, Chief Engineer; (4) Tables of the rainfall measured at the different stations of the department during each month of the year, with a sketch of the specialities of the rainfall of last year, by Dr. Fines; and (5) Meteorological observations made at fifteen stations in the department. The close union now being drawn in France between meteorology on the one hand, and agriculture and horticulture on the other, as evinced by the Annual Report of the Meteorological Commission of the Pyrénées-Orientales, as well as by the subjects brought under special consideration at the Meteorological Congress of Poitiers, speaks well for the future of French meteorology.

THE *Agricultural Students' Gazette* is a small quarterly publication, evidently issued under the auspices of the authorities of the Royal Agricultural College at Cirencester, and which is professedly edited by students of that Institution. Such a publication ought to be eminently useful. It should aid in promoting an enlightened system of agricultural education, which is one of the great wants of the age. If well conducted, the journal cannot fail to assist in making known the merits of the College and of kindred institutions. It does not rival any existing periodical. While edited by students, the chief articles are contributed by professors. To No. 3 Prof. Church contributes a valuable paper on the flesh-forming matter of root-crops. Among the other contributions we would refer to a short but interesting paper from the pen of Prof. McNab, on mould, and another on sewage farming, written by one of the students, Mr. John D. Custance. Prof. Wrightson contributes a paper on the improvement of poor clay pastures, which has evidently been carelessly if not thoughtlessly put together. This periodical merits our best wishes. We see no reason why it should not in due time occupy a leading place among our scientific agricultural journals.

PROF. KERNER, of Innsbrück, has published an interesting pamphlet on the Hybrid Primulaceæ of the Alps. Of these he enumerates no less than twenty-five belonging to the genus *Primula*, four to *Androsace*, and two to *Soldanella*; some of which have been treated as independent species, as that between *P. subcaulis* and *officinalis* under the name *P. brevistyla*, DC., and that between *P. suprauricula* and *hirsuta* under that of *P. pubescens*, Jacq. By far the majority (twenty) of the *Primula*-hybrids belong to a single section, *Auriculastrum*, the remainder to *Primulastrum*. Of "derivative-hybrids"—that is, those resulting from the crossing of a hybrid with one of its parent-forms—he knows only one or two certain instances. In two separate reprints, "Floristische Notizen" and "Ueber einige Pflanzen der Venetianer Alpen," Prof. Kerner describes several new plants of the Southern Alps.

ON November 1 a Stenographic Exhibition was opened in a room of the Pedagogic Museum of the College, Rome. Stenography at the present day occupies a very important part in the requirements of public life, and we believe the effort to encourage its study by a public exhibition will lead to useful results. On the walls of the room were a list of the Italian towns that had a school or society for stenography. The only method followed is that of Gabelsberg-Noe. On a table in the centre of the room were stenographic attempts of every kind, from large plates for elementary study to the smallest and most minute works. In one case, Dante's "Divine Comedy" was copied out into a book of Lilliputian dimensions. On a post-card one stenographer had written 3,660 words. The committee who arranged the exhibition wish to reproduce on the historical wax tablet the stenographic marks with which Tiro wrote the speeches of Cicero.

ON November 2 took place the opening ceremony of the scholastic year of the University of Rome. Prof. Scalzi read a critico-historical exposition of a collection of surgical apparatus belonging to lithotomists and oculists of the sixteenth and eighteenth centuries, which he found among families of the province of Umbria. Prof. Scalzi gave some very interesting details, showing that these instruments were invented in Italy, and not by foreigners, as has been supposed. He showed also that the study of the original instruments was of great interest in connection with the history of the progress of the surgical art. On two tables were arranged eighty instruments which had belonged to surgeons of Novicia and Delle Preci in Umbria. Many of these instruments, it was interesting to observe, resembled those found at Pompeii and others found at Ravenna.

A REPORT by Mr. Frank Buckland, on the fisheries of Norfolk, recently issued, states as a remarkable fact that large numbers of sea trout are annually caught off the coasts of that county, though the rivers which flow through it are naturally incapable of producing *Salmonide*. The fish thus caught are visitors from the salmon rivers in the north, viz., the Tyne, the Tees, the Coquet, and the Tweed. The object of this visit to the coasts of Norfolk and Suffolk is to find food, which exists in abundance in the shape of the spawn and fry of the many varieties of fish which abound in those waters. The report contains much interesting matter relative to the crab, lobster, and other sea-coast fisheries, and to the fisheries in the fresh-waters of Norfolk and Suffolk.

THE *Comptes Rendus* for October 4 last contains a paper on the interpretation of the sphygmograph trace, by M. Bouillaud. The author gives reasons, which we think peculiarly unsatisfactory, in favour of the sphygmograph trace—a curve now fairly understood—supporting an assumption of his that each cardiac revolution consists of two periods of action and two of repose, instead of one systole and its associated secondary consequences.

OUR readers will find, in the current number of the *Ibis* a short account of the late veteran Swedish ornithologist, Carl J. Sundevall, whose excellent investigations, especially with reference to the Passerine birds, have done much towards the development of sound classificational principles.

WE would direct the special attention of our zoological and geological readers to a paper by Prof. Owen in the current number of the *Quarterly Journal of the Geological Society*, on a fossil Sirenian animal from Jamaica, previously described by him, and named *Prorastomus sirenoïdes*. In this animal the premaxilla of each side gives indications of having supported three not large teeth, at the same time that there were eight teeth of the molar series above and below, on each side. The species was considerably smaller than the Manatee; the skull and atlas vertebra are the only parts known; in conjunction with

Felsinotherium forrestii it fills an important gap in our knowledge of the pedigree of the Sirenia.

THE *Geographical Magazine* for December contains a paper of great value on the Amú Darya region, by N. P. Barbot de Maruz, who in the summer of 1874 made a journey from Fort Alexandrovski, in the Caspian, to the foot of the Thian-shan. He describes the principal geological features observed along the route, and promises a full report of his researches when he has been able to arrange his abundant materials. Another paper, by Mr. Ravenstein, describes Mr. Stanley's recent discoveries, and is illustrated by two good maps, one of the Victoria Nyanza, principally according to Mr. Stanley, and another of the regions of the Upper Nile, embodying the results of the explorations of Burton, Speke, Grant, Stanley, Baker, Long, and others.

PARTS 10, 11, and 12 (in one), of the well-conducted Italian geographical journal, *Cosmos*, are to hand. The following are the principal papers:—A letter from F. Giordano, giving some account of the condition of New Guinea, in reference to a proposal to make use of some part of it as an Italian penal settlement. Another letter, from Dr. Beccari, describes some results of his investigations into Papuan ethnology. The first of a series of papers on Arctic Geography gives the results of recent Arctic exploration in the Baffin's Bay and Spitzbergen directions.

WE learn from the *American Naturalist* that State Associations of Archaeology have been formed in Indiana and Tennessee, similar to that already existing in the State of Ohio. Their field of work is most extensive and important.

ON Thursday, November 26, at 6.35 P.M., an earthquake shock was distinctly felt at Lyons. The commotion, which travelled northwards, lasted from fifteen to twenty seconds.

A SHOCK of earthquake was felt at Naples on Dec. 6, and also throughout the provinces of the Basilicata, Terra di Lavoro, and Salerno.

THE additions to the Zoological Society's Gardens during the past week include a male Prince Alfred's Deer (*Cervus alfredi*), born in the Gardens; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. C. F. Wood; a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Miss Kate Symonds; two Alligators (*Alligator mississippiensis*) from North America, deposited; twenty-nine Basses (*Labrax lupus*); a Grey Mullet (*Mugil capito*), and six Cottus (*Cottus bubalis*) from home seas, purchased.

THE DIFFERENCE OF THERMAL ENERGY TRANSMITTED TO THE EARTH BY RADIATION FROM DIFFERENT PARTS OF THE SOLAR SURFACE

THE observations relating to the temperature of the polar regions, referred to in the article (vol. xii. p. 517), at first led to the supposition that the rays projected from the north pole of the sun transmit a perceptibly greater energy to the actinometers than the rays from the opposite pole. Subsequent observations having positively established the fact that the polar and equatorial zones transmit equal intensities, it became evident that some other cause than difference of temperature within the polar regions influenced the actinometers. The only valid reason that could be assigned in explanation of the anomaly being the considerable angle subtended, and the consequent difference of zenith distance of the opposite poles of the sun, my table of maximum solar intensity for given zenith distances (prepared from data collected during a series of years) was consulted, in order to ascertain the influence of zenith distance. The observations indicating a higher temperature at the north pole, it should be mentioned, had been made while the sun's zenith distance ranged between 32° and 33° at noon. Now the table referred to shows that there is a difference of radiant intensity of 63°·63 – 63°·40 = 0°·23 F. between the stated zenith distances. The mean angle subtended by the sun being fully thirty-two minutes,